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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/872,256	06/01/2001	Kimio Tsunemasu	P/2041-61	4737

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EXAMINER

OLIVA, CARMELO B

ART UNIT	PAPER NUMBER
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2831

DATE MAILED: 02/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/872,256

Applicant(s)

TSUNEMASU ET AL.

Examiner

Carmelo Oliva

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 December 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3,5,6, and 8-10 rejected under 35 U.S.C. 102(b) as being anticipated by Agarwala et al (US 5,268,072).

Regarding claim 1, Agarwala et al discloses in Fig. 1E, a mounting structure for connection of a pad (14) to connection wiring (16) on a circuit board (15),

a via (also 14) is formed through the circuit board (15), the via providing electrical contact between the pad (14) and the connection wiring (16).

Regarding claim 2, the via is depressed from the annular pad on the circuit board to establish a connection to the connection wiring at a tip end thereof (see Fig. 1E).

Regarding claims 3 and 8, a plating (18) is provided on the pad and via (14) as shown in Fig. 1E.

Regarding claims 5,6,9 and 10, the via has a truncated cone shape in the through hole and is integrally connected to the connection wiring (see Fig. 1E).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwala et al in view of Barrow (US 5,796,589).

Regarding claim 4, Agarwala et al discloses the structure as applied to claim 1 above, however location of the via is not specified. Barrow teaches a mounting structure of a semiconductor package having vias that correspond to a corner of the semiconductor package (see Fig. 2). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the vias correspond to corners of the package as taught by Barrow for the purpose of mounting the package to another device and to provide stability, evenness, etc. while mounting the package.

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Regarding claim 7, Agarwala et al discloses the structure as applied to claim 2 above, however no solder resist is present to provide a space between the resist and the pad. Barrow teaches a mounting structure in Fig. 4 wherein there is a solder resist (42) having a space between it and the pad (20). It would have been obvious to one having ordinary skill in the art at the time the invention was made for the mounting structure to have a solder resist (42) having a space between it and the pad as taught by Barrow in order to prevent cross-wicking between the pads (col. 3, lines 38-40) and to provide additional routing space on the surface of the board (col. 3, lines 42-46).

Response to Arguments

6. Applicant's arguments filed December 10, 2002 have been fully considered but they are not persuasive.

The applicant argues that the device of Agarwala et al does not show a printed circuit board. The examiner uses the broadest definition of the claimed limitations when determining patentability, and since a printed circuit board in its broadest definition is an insulating substrate on which circuits are mounted, the examiner believes that Agarwala et al does disclose the claimed limitations. In Figure 1E, Agarwala et al shows an insulating substrate 15 on which circuits 16 are mounted, which meets the limitation of a printed circuit board in its broadest definition. Further, the applicant argued that the via does not extend fully through the board of Agarwala et al. As also shown in Figure 1E, the via (part of layer 14) extends fully from one surface to the opposite surface of the

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substrate 15. Therefore, all claimed limitations are met and the examiner's previous rejections stand.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Akram, U.S. 6,314,641, specifically discloses a printed circuit board which also has a via extending from a pad on one surface to circuitry on the opposite surface. This reference could be used in a 35 USC 102 rejection of claim 1. Note that Barrow '589, listed on the applicant's IDS of Paper No. 6, could also be used in a 35 USC 102 rejection against claim 1.

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carmelo Oliva whose telephone number is (703)305-

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0835. The examiner can normally be reached flexible hours on Monday through Friday with every other Wednesday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard, can be reached on (703)308-3682. The fax phone number for this Group is (703) 305-3431 for regular communications, and (703) 305-1341 for after final communications.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956.

Dean A. Reichard 2/24/03
LENA A. REICHARD
TECHNOLOGY PATENT
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